



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

June 11, 2004

Timber Pile Inspection
& New ISIS Item – Substructure Material (60A/60B)

COUNTY ENGINEERS/SUPERINTENDENT OF HIGHWAYS
MUNICIPAL ENGINEERS/DIRECTOR OF PUBLIC WORKS
CONSULTING ENGINEERS

#04-08

The use of timber pile supported structures was common on local highways prior to the early 1970s. Many of the piles for these structures are now reaching the end of their useful life, and deterioration of timber piles is currently the greatest cause of bridge postings and closures on the local system. Therefore, the department is now emphasizing the need to exercise extra vigilance when inspecting timber piles and is establishing a new data item in the Illinois Structure Information System (ISIS) to facilitate tracking of these and other substructure material types.

PILE INSPECTION GUIDELINES

Extra care should be taken when inspecting timber piles. Loss of section of timber piles generally occurs in areas where the presence of water/moisture is cyclical. Once timber pile deterioration commences, the rate of deterioration is often rapid.

Timber pile deterioration is normally not expected in areas that are always submerged or always dry; deterioration is normally at the ground line or near the normal water elevation on the pile. However, if the water is ponded or stagnant, it is possible for organic action to deteriorate timber piles below the normal water elevation. In addition, if the timber pile has deflected at the top, if the top of the pile is not protected, or if the cap is not directly over the top of the pile, water may infiltrate the pile from the top and cause deterioration in other locations along the length of the pile.

Loss of section in timber piles is often not evident by standard visual observation and sounding of the piles must be performed. If there are concerns based on the sounding, small holes may be drilled or cored into the piles to determine the extent of any loss of section. The holes should then be properly filled using treated timber plugs. This level of investigation is normally performed by personnel from the Local Bridge Unit (LBU) as part of the Damage Inspections conducted to determine the bridge load carrying capacity. Damage Inspections are performed by the LBU when the condition of a structure has deteriorated either at the request of the Local Agency or as determined by a routine query by the LBU of the ISIS database.

Extra effort is required to accurately determine the condition of timber piles. If the elevation of the water is high during the National Bridge Inspection Standards (NBIS) inspection, it is imperative to schedule a follow-up inspection to sound the piles down to the low water line.

Reference information on substructure inspections may be found in Section 3.8.2 of AASHTO publication "Manual for Condition Evaluation of Bridges, 1994" and the 1995 through 2003 Interims. The criteria used by the department for determining the need to schedule a Damage Inspection are provided in Circular Letter #96-11. When timber pile deterioration is noted during a routine safety inspection, the LBU should be contacted to perform a Damage Inspection.

ISIS ITEM 60A/60B – SUBSTRUCTURE MATERIAL

To facilitate better tracking capabilities of timber piles and other substructure material types, the Bureau of Bridges and Structures, in conjunction with the Office of Planning and Programming, has added new Items 60A/60B, "Substructure Material," to the ISIS and the "Structure Information and Procedure (SIP) Manual." Item 60A will identify the substructure material type for abutments, and Item 60B will identify substructure material type for piers. The critical substructure material will be designated by codes (See attachment).

When coding items 60A/60B, the primary concern is the substructure elements that are supporting the structure. These elements will generally be walls, piles or footings. When determination is made by field inspection, the portion of the substructure unit which is exposed to air at low water elevation should be considered when determining the material type of the substructure units. A pile bent spill thru abutment with a concrete cap would have the material type coded as concrete if the piles are not exposed. Wingwalls or timber backing behind abutment piles should not be considered as elements supporting the structure.

This initiative will entail an initial check of the existing inventory. This may be accomplished by a review of existing plans, bridge records, photos, or by conducting a field visit; especially if required to verify if piles are exposed. Once the information is collected, it should be submitted to the District Bureau of Local Roads and Streets (BLRS) for entering into the ISIS.

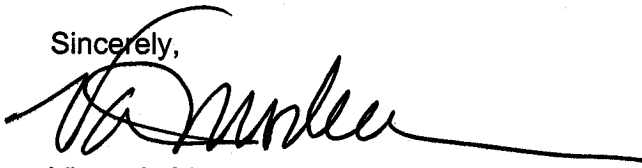
In the best interests of the owner and the traveling public, we recommend that all bridges that are known to be supported by exposed timber piles be inspected as soon as possible in order to verify conditions and to record Item 60A/60B information in ISIS.

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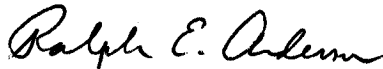
We request that information be provided to the District BLRS for Item 60A/60B for all bridges known to have timber piles incorporated in their construction by December 31, 2004. For structures not having timber piles incorporated in the substructure, Item 60A/60B information should be obtained no later than the next Routine NBIS Inspection. Also attached are revised Inventory Turnaround Report (S105) and Inspector's Inventory Report (S114) for your use.

If you have any questions or need additional information, please contact Ralph Anderson at 2300 South Dirksen Parkway, Springfield, Illinois 62764 or at 217/782-2124.

Sincerely,

A handwritten signature in black ink, appearing to read "Victor A. Modeer", with a long horizontal flourish extending to the right.

Victor A. Modeer, P.E.
Director of Highways

A handwritten signature in black ink, appearing to read "Ralph E. Anderson", with a long horizontal flourish extending to the right.

Ralph E. Anderson, P.E., S.E.
Engineer of Bridges and Structures

JFS/
cc- Illinois Department of Natural Resources
FHWA, Illinois Division/Attn: Dan Brydl
Illinois State Toll Highway Authority

Attachment

HISTORY KEPT YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	ILLINOIS HIGHWAY INFORMATION SYSTEM STRUCTURE INFORMATION AND PROCEDURE MANUAL		
NBIS REQUIRED YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	ITEM NAME SUBSTRUCTURE MATERIAL (Abuts. & Piers)	ITEM NO. 60A / 60B PAGE 1 of 1 EFF. DATE	
	ISIS	MMIS	
RESPONSIBLE FOR UPDATE	District Program Development	N/A	
STRUCTURES	All Structures	N/A	
UPDATE SCREENS	(2) General Inventory 1	N/A	
INQUIRY SCREENS	(1) Inventory Data 1	N/A	

DESCRIPTION AND PURPOSE OF ITEM

This item records the most critical substructure supporting material in the abutments and piers. Item 60A is used for abutment material types. Item 60B is used for pier material types. For both items, the most critical material type should be coded.

When existing plans are available, the determination of critical material may be made using those plans. However, this item should be verified in the field. If existing plans are not available, the substructure material should be field verified. Only the portions of the substructure unit that are exposed to air at low water elevation should be considered in this determination. For example, substructure units with concrete footings on unrepaired timber piles are coded "2" (timber) if existing plans show timber piles and the piles are exposed, but "5" (concrete) if the existing plans are not available and piles are not exposed when field verified.

CODE AND SCREEN ENTRY INSTRUCTIONS

A one-digit field for each item.
 Enter the appropriate code for abutment (Item 60A) and pier (Item 60B), by criticality.

<u>Code</u>	<u>Description</u>
1	Timber with repairs made
2	Timber
3	Steel
4	Masonry
5	Concrete
N	Not Applicable

Note: The term "supporting" refers to the material in the substructure that provides the structural basis for the substructure. For example, for steel piles encased in reinforced concrete, the code for this item would be "3" for steel, exposed or unexposed.

EXAMPLES:

	<u>Item 60A</u>	<u>Item 60B</u>
One unrepaired timber abutment, one steel abutment, one unrepaired timber pier, one steel pier, and one masonry pier.	Enter: 2	2
Concrete abutments with masonry fascia, one pier with five timber piles, of which three piles have been repaired.	Enter: 5	1
Culverts	Enter: N	N
3-Sided Structure on concrete footings.	Enter: 5	N

STRUCTURE NUMBER: 001 - 0002

DIST: 6 MAINTENANCE COUNTY: ADAMS

MUNICIPALITY:

STATUS: OPEN - NO RESTRICT

STATUS DATE: 04 / 1988

MAINTENANCE TOWNSHIP: HOUSTON

KEY RTE ON: FEDERAL-AID PRIMARY

0733

STA:

3.44

SEG:

APRT: MAIN ROUTE

0.000 SUFFICIENCY RATING: 082.3

KEY RTE UN:

0000

STA:

0.00

SEG:

APRT:

0.000 HBRRP ELIGIBLE: NO

AASHTO LENGTH: 24.0

***** SCREEN 1 *****

ITEM #	ITEM NAME	EXISTING VALUES	REVISIONS	ITEM #	ITEM NAME	EXISTING VALUES	REVISIONS
(7)	FACILITY CARRIED:	IL 61/94		(101)	PARALLEL DESIGNATION:	N	
(6)	FEATURE CROSSED:	BIG NECK CREEK		(8E)	REPLACED BY STRUCT NUMBER:	000 - 0000	
(9)	LOCATION:	.5M N IL 61/94 SPLIT		(8D)	REPLACES STRUCTURE NUMBER:	000 - 0000	
(7A)	BRIDGE NAME:			(49)	STRUCTURE LENGTH (FT):	26.0	
(3B)	MAINTENANCE COUNTY:	001		(112)	AASHTO BRIDGE LENGTH (FT):	24.0	
(3B1)	MAINTENANCE TOWNSHIP:	11		(51)	BRIDGE ROADWAY WIDTH (FT):	29.0	
(21)	MAINTENANCE RESPONSIBILITY:	01		(32)	APPROACH ROADWAY WIDTH (FT):	32.0	
(42)	SERVICE ON/UNDER:	1 5		(52)	DECK WIDTH (FT):	32.2	
(22A)	REPORTING AGENCY:	1		(107/A)	DECK TYPE/THICKNESS (IN):	A 16.5	
(20)	TOLL FACILITY:	0		(48)	LENGTH OF LONGEST SPAN (FT):	25.0	
(35)	STRUCTURE FLARED:	0		(45/46)	NBR SPANS MAIN/APPROACH:	01 0	
(31)	DESIGN LOAD:	12		(43A/B)	MAIN SPAN MATERIAL/TYPE:	1 01	
(31A)	STRUCT STEEL WEIGHT (LBS):	0		(44AN/BN)	NEAR APPR SPAN MATRL/TYPE:	#1	
(60A/B)	SUBSTR MATRL:					#2	
(8A1)	BRIDGE REMARKS (EXISTING):			(44AF/BF)	FAR APPR SPAN MATRL/TYPE:	#1	
						#2	

BRIDGE REMARKS (REVISED):

***** SCREEN 2 *****

ITEM #	ITEM NAME	EXISTING VALUES	REVISIONS	ITEM #	ITEM NAME	EXISTING VALUES	REVISIONS
(34/A)	SKEW DIR/ANGLE (DG-MN-SEC):	N / 0 0 0		(202)	TRAFFIC PERMITS RTE SEC NBR:		
(33)	BRIDGE MEDIAN TYPE:	0		(8B)	MULTI-LEVEL STRUCTURE NUMBER:		
(33A)	BRIDGE MEDIAN WIDTH (FT):	0		(62A)	CULVERT CELLS (COUNT):	0	
(38)	NAVIGATION CONTROL:	0		(62B)	CULVERT CELL WIDTH (FT):	0.00	
(39)	NAVIGATION VERT CLEARANCE (FT):	0		(62C)	CULVERT CELL HEIGHT (FT):	0.00	
(40)	NAVIGATION HORZ CLEARANCE (FT):	0		(62D)	CULVERT OPENING AREA (SQ FT):	0.0	
(50A)	SIDEWALK WIDTH ON - RIGHT (FT):	0.0		(62E)	CULVERT FILL DEPTH (FT):	0.0	
(50B)	SIDEWALK WIDTH ON - LEFT (FT):	0.0		(16)	LATITUDE:	40 D 08 M 43.73 S	
(50C)	SIDEWALKS UNDER STRUCTURE:	0		(17)	LONGITUDE:	91 D 03 M 58.80 S	
(36E)	GUARDRAILS ON - RIGHT:	0		(98A)	BORDER BRIDGE STATE NUMBER:		
(36F)	GUARDRAILS ON - LEFT:	0		(98B)	BORDER BRIDGE ADJ STATE (% RESP):	0	
(8C)	RR CROSSING NUMBERS:			(99)	BORDER BRIDGE NUMBER EXISTING:		
(55B1)	RR LATERAL UNDERCLEARANCE (FT):	0.0			BORDER BRIDGE NUMBER REVISED:		
(54B3)	RR VERT UNDERCLEAR (FT-IN):	0 - 0					

ILLINOIS DEPARTMENT OF TRANSPORTATION
ILLINOIS STRUCTURE INFORMATION SYSTEM
INSPECTOR'S INVENTORY REPORT

DATE: 06/07/2004

STRUCTURE NUMBER: 001 - 0002

DIST: 6

MAINTENANCE COUNTY: ADAMS

MUNICIPALITY:

MAINTENANCE TOWNSHIP: HOUSTON

FACILITY CARRIED: IL 61/94

BRIDGE NAME:

FEATURE CROSSED: BIG NECK CREEK

LOCATION: .5M N IL 61/94 SPLIT

(21) MAINTENANCE RESP: I.D.O.T.

(22A) REPORTING AGENCY: I.D.O.T. - BUREAU OF MAINTENANCE

(41) BRIDGE STATUS: OPEN - NO RESTRICT

(41A) BRIDGE STATUS DATE: 04 / 1988

(41B) STATUS REMARKS:

CONSTRUCTION INFORMATION

ITEM #/NAME

EXISTING VALUES

(27/27A) YEAR/TYPE: 1991 / RECONSTRUCTION

(27B) ROUTE: FAP 518

(27C) SECTION: 101B

(27D) STATION: 1260+70

(27E) CONTRACT:

(27F) PROJECT: 00000000000000

(27G) BUILT BY:

(27H) REMARKS: (BELOW)

1991REHAB. - NEW SUPERSTRUCTURE

***** SCREEN 1 *****

ITEM # ITEM NAME EXISTING VALUE REVISION ITEM # ITEM NAME EXISTING VALUE REVISION

(101) PARALLEL DESIGNATION: N

(35) STRUCTURE FLARED: 0

(31) DESIGN LOAD: 12

(31A) STRUCT STEEL WEIGHT(LBS): 0

(60A/B) SUBSTR MATRL:

(8A1) BRIDGE REMARKS (EXISTING):

BRIDGE REMARKS (REVISED):

(49) STRUCTURE LENGTH (FT): 26.0

(112) AASHTO BRIDGE LENGTH (FT): 24.0

(51) BRIDGE ROADWAY WIDTH (FT): 29.0

(32) APPROACH ROADWAY WIDTH (FT): 32.0

(52) DECK WIDTH (FT): 32.2

(48) LENGTH OF LONGEST SPAN (FT): 25.0

(107/A) DECK TYPE/THICKNESS (IN): A 16.5

(45/6) NBR SPANS MAIN/APPROACH 1 0

(43A/B) MAIN SPAN MATERIAL/TYPE: 1 01

(44AN/BN) NEAR APPR SPAN MATRL/TYPE#1

#2

(44AF/BF) FAR APPR SPAN MATRL/TYPE #1

#2

***** SCREEN 2 *****

ITEM # ITEM NAME EXISTING VALUE REVISION ITEM # ITEM NAME EXISTING VALUE REVISION

(34/A) SKEW DIR/ANGLE(DG-MN-SEC): N / 00 00 00

(33) BRIDGE MEDIAN TYPE: 0

(33A) BRIDGE MEDIAN WIDTH (FT): 00

(38) NAVIGATION CONTROL: 0

(39) NAVIGATION VERT CLEARANCE (FT): 0

(40) NAVIGATION HORZ CLEARANCE (FT):

(50A) SIDEWALK WIDTH ON - RIGHT (FT): 0.0

(50B) SIDEWALK WIDTH ON - LEFT (FT): 0.0

(50C) SIDEWALKS UNDER STRUCTURE: 0

(36E) GUARDRAILS ON - RIGHT: 0

(36F) GUARDRAILS ON - LEFT: 0

(55B1) RR LATERAL UNDERCLEARANCE (FT): 0.0

(54B3) RR VERT UNDERCLEARANCE (FT-IN): -

(62A) CULVERT CELLS (COUNT): 0

(62B) CULVERT CELL WIDTH (FT): 0.00

(62C) CULVERT CELL HEIGHT (FT): 0.00

(62D) CULVERT CELL OPENING AREA (SQ FT): 0.0

(62E) CULVERT FILL DEPTH (FT): 0.0

***** SCREEN 9 ---> KEY ROUTE ON ***** SCREEN 10 ---> KEY ROUTE UNDER *****

ITEM # ITEM NAME VALUE REVISION

(28) NUMBER OF LANES: 02

(102) ONE OR TWO WAY TRAFFIC: 2

SOUTH OR EAST
VALUE REVISIONNORTH OR WEST
VALUE REVISION

(47) MAX. RDWY WIDTH (FT): 29.0

(47A/B) HORIZONTAL (FT): 30.3

(53A/B) MIN VERT (FT-IN): 99 11

(10A/B) 10 FT VERT (FT-IN): 99 11

ITEM # ITEM NAME VALUE REVISION

(28) NUMBER OF LANES: 00

(102) ONE OR TWO WAY TRAFFIC:

SOUTH OR EAST
VALUE REVISIONNORTH OR WEST
VALUE REVISION

(47) MAX. RDWY WIDTH (FT): 0.0

(47A/B) HORIZONTAL (FT): 0.0

(54B1/2) MIN VERT (FT-IN): 00 00

(10A/B) 10 FT VERT (FT-IN): 00 00

(55B/56) MIN LATERAL (FT): 0.0